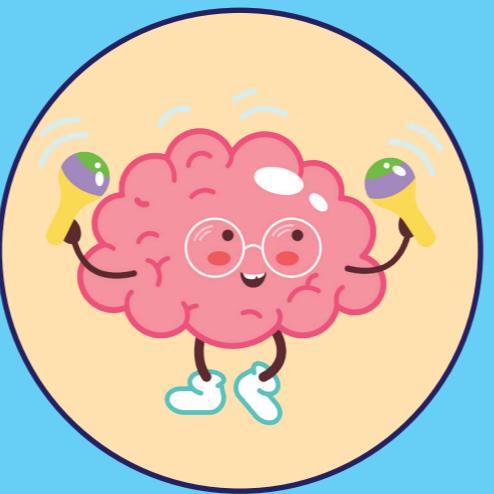


MUSIC AND ATTENTIONAL CONTROL

What happens in the deep structures of the brain during aging?

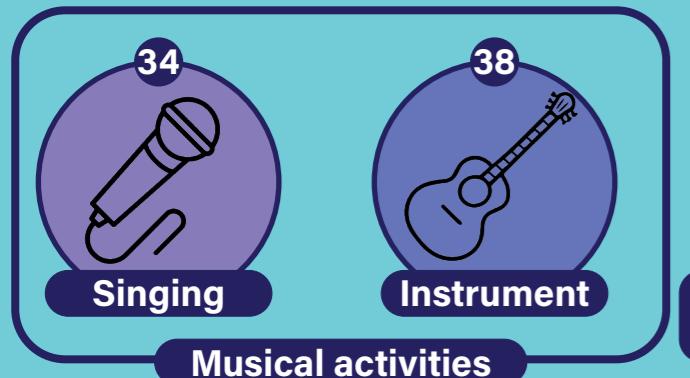


CONTEXT

Aging is accompanied by a decline in brain structure, which causes a decrease in cognitive performance, including attentional control. Attentional control can be divided into two components: attention, which is the ability to select specific information from one's environment, and inhibition, which is the ability to ignore other information. Attentional control allows us, for example, to focus on one person when several people are talking at the same time. Several regions of the cortex are involved in attention, as well as several subcortical regions (see Figure 1), i.e., regions located deep within the brain, and regions of the cerebellum (see Figure 2).

Practicing a musical activity could trigger a reorganization of the brain that would reduce the effects of aging on the brain and cognition. However, this process is complex and still relatively unknown. Specifically, the links between the aging of subcortical structures, musical practice, and their effects on attention have been little studied to date. Our study, which is part of the PICCOLO project, addresses these issues.

Comparison de 3 groups

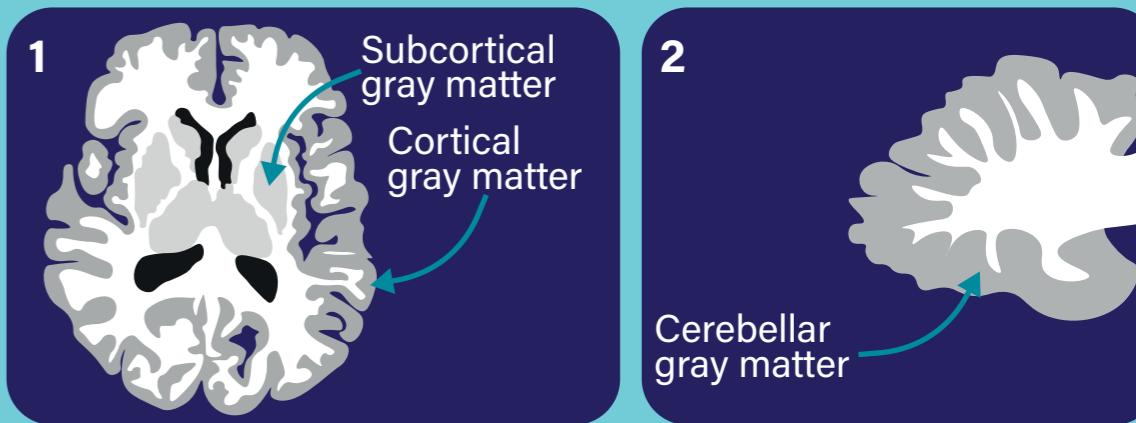


People practising: golf, billards, knitting, yoga, pétanque, curling, video games, bowling, tai chi

Subcortical attentional system

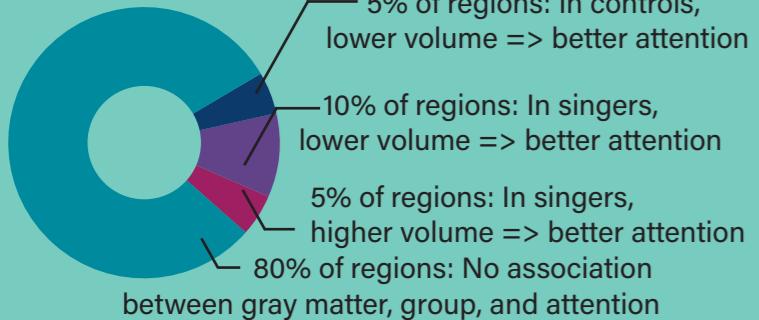
The attentional system has mainly been described in terms of the brain's cortical gray matter (see Figure 1). However, several subcortical and cerebellar regions play a role in attention. For our study, 38 subcortical and cerebellar regions were selected to investigate the effects of musical training. Two regions were added as controls (total of 40 regions).

Subcortical gray matter and cerebellum

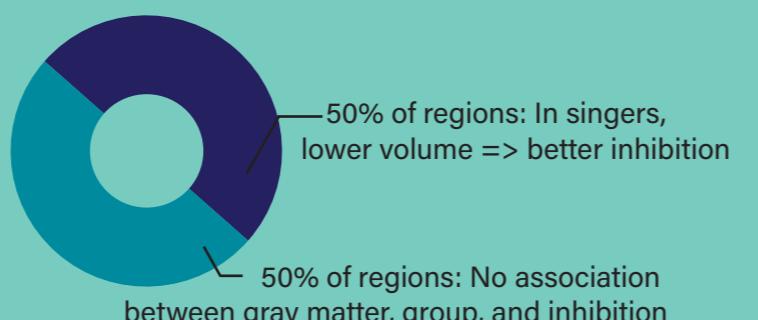


Regions that differ between groups in terms of attentional control

Attention



Inhibition



Relationship between subcortical volume and attentional performance



When studying the relationship between attention and subcortical volume, a surprising result is observed: in singers and, to a lesser extent, in non-musicians, a lower volume of subcortical gray matter is associated with better attentional performance. This relationship is particularly marked for inhibition.



In contrast, instrumentalists have a different profile. Although they have better attention than singers and non-musicians, their performance is generally not related to their subcortical gray matter volume.

To Summarize

The type of musical practice influences the relationship between subcortical structures and inhibition, with distinct profiles in singers and instrumentalists.

Source

Sicard A, Tremblay P. Subcortical gray matter aging and attentional control in amateur musicians and nonmusicians. *Ann N Y Acad Sci.* 2025 Sep;1551(1): 167-188. doi: 10.1111/nyas.70023. Epub 2025 Aug 23. PMID: 40849290; PMCID: PMC12448275.



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